THE

AMERICAN JOURNAL

OF THE MEDICAL SCIENCES.

JULY, 1887.

SARCOMA OF THE FEMALE BREAST;

BASED UPON A STUDY OF ONE HUNDRED AND FIFTY-SIX CASES.

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In my *Treatise on Tumors of the Mammary Gland*, published in 1880, may be found a chapter on sarcoma, in which the general pathology and life-history of the affection are deduced from an analysis of sixty cases confirmed by microscopical examination. This account remains up to the present time the most trustworthy description of this neoplasm with which I am acquainted; and it constitutes the only one in which an attempt has been made upon anything approaching an extended scale to determine the relations which exist between its minute features and its clinical characters. Feeling that many points were still obscure, I have, during the past seven years, kept a careful record of my own cases, and noted those reported by other surgeons, so that my collection now embraces one hundred and fifty-six cases,[1] including nineteen of my own, a critical examination of which affords the data for this paper.

The varieties and subvarieties of sarcoma of the female mamma are the same as those met with in other organs. The principal ones—the spindle-celled, round-celled, and giant-celled—are determined by the prevailing form of the cells, and the first two are further separated, in accordance with the dimensions of the cells, into the small-celled and large-celled. The subvarieties are constituted by the nature or arrangement of the intercellular substance; by various transformations or combinations with other neoplastic tissues; by the presence or absence of duct or retention cysts; and by the persistence of glandular elements. Hence the modified forms of sarcoma are the fibrous, lymphoid, alveolar, myxomatous, cartilaginous, osteoid, calcifying, melanotic, telangiectatic, hemorrhagic, cystoid, solid, cystic, and adenoid.

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[1] I have to express my thanks to Dr. Sands, Dr. Markoe, and Dr. Bull, of New York, and Mr. Bryant, of London, for unpublished cases from their practice, and to Mr. Henry Morris, of London, Mr. Humphry, of Cambridge, Mr. Banke, of Liverpool, Mr. Whitson, of Glasgow, and Mr. Page, of Newcastle-on-Tyne, for the final histories of their recorded cases.

Of the varieties of sarcoma, the spindle-celled, which include the fibrous, constitute 68 per cent., the round-celled 27 per cent., and the giant-celled 5 per cent. of all cases.[1] Of the subdivisions, 50 per cent. are cystic, the term including the barren and proliferous cysts; 50 per cent. are solid or noncystic; 33 per cent. are adenoid, the glandular structures persisting principally in the spindle-celled growths; 12.80 per cent. are myxomatous, the combination being almost peculiar to the spindle-celled and cystic tumors; 7.69 per cent. are telangiectatic and hemorrhagic; 7 per cent. are cystoid, or the seat of softening cysts; 2.56 per cent. are osteoid; 2.56 per cent. are calcifying; 1.21 per cent. are cartilaginous; 1.92 per cent. are alveolar; 1.21 per cent. are lymphoid; and 1.21 per cent. are melanotic or pigmented. It is interesting to note that in the ten examples of calcification, chondrification, and ossification, the tumors were spindle-celled in seven, and cystic in five. In the three cases of alveolar sarcoma the tumor was round-celled in two, and giant-celled in one; while both of the pigmented growths were alveolar and round-celled.

Like the other encapsuled neoplasms of the mamma, circumscribed sarcomata are ovoid, rounded, or spherical, lobed or bossed, and seldom smooth and uniform, the surface irregularities being most marked in the cystic variety. As a rule, they are unattached to the gland, but push it aside, compress, and flatten it, or cause it to atrophy, although they are, in rare instances, united to it by a pedicle. Their consistence varies with their minute structure and degenerations, the pure spindle-celled and giant-celled tumors being firm, like fibromata, while the round-celled are soft and elastic. The spindle-celled, however, are soft in about one-third of all examples, when they will be found to be composed of small fusiform cells, or to have undergone myxomatous or fatty transformation, or to be the seat of interstitial hemorrhage. The round-celled are hard in about one-sixth of all cases, when they will usually be found to be rich in

[1] Of the nineteen cases that have come under my personal observation, thirteen were spindle-celled and six round-celled. Of the former, five were firm, small adenoid growths; one was a telangiectatic and myxomatous, and one a myxomatous medullary sarcoma; six were firm cystic, and in two of these the cysts were filled with vegetations. Of the six round-celled, one was lymphoid; one was a myxomatous cystic medullary growth; two were proliferous cystic, and one of these was medullary, and two were cystoid medullary tumors.

fibrous intercellular substance. In one of the best illustrations of round-celled tumors that I have ever seen, the tissue was dense, so that they are by no means synonymous with soft, medullary, or encephaloid sarcomata, although they are usually much softer than the spindle-celled variety, since they are peculiarly rich in cells and bloodvessels, and since their intercellular substance is usually mucoid. The spindle-celled growths sometimes creak or cry under the knife, in which event they come under the category of fibrous sarcomata, from the large admixture of fibrous tissue. Their consistence varies, moreover, with their stage of development. If they are solid, it is entirely or almost uniform; while they are soft and elastic, or soft and fluctuating at some points, and especially at the larger bosses, and hard at others, when they are the seat of cysts occupied by fluid, or solid contents, or by both. In about one-fourth of the cystic growths, however, the tumor is firm throughout, in consequence of the cysts being so deeply seated as to elude detection by manipulation.

On section the spindle-celled tumors are usually smooth, succulent, and glistening, and of a white or grayish-white color, particularly if they are poor in vessels, the tint being rosaceous-white or rosaceous-gray when their vascular supply is larger. The round-celled tumors, on the other hand, are rarely pure white, but, from their relatively greater vascularity, reddish-white, reddish-yellow, or reddish-gray, the hue being not infrequently comparable to that of the fœtal brain. When they are highly vascular the rosaceous tint is very marked, or they are pervaded by macroscopic vessels; or dotted with minute spots of ecchymosis, or patches, or streaks of bright red or brown, or various intermediate shades of pigmentation. In not a few instances the soft brain-like tissue is so extensively interspersed with clots of blood, and with tomentous cysts containing blood, that the term hematoid or hemorrhagic sarcoma is not inappropriately applied to them, or the term fungus hematodes when they protrude through the skin. A pronounced yellowish color indicates fatty metamorphosis, which may pervade almost the entire tumor, or be confined to limited areas or to the vegetations alone, while the remainder is white or gray, thereby imparting to it a mottled aspect. A yellowish tint also denotes myxomatous changes, so that, as in the former instance, the mass of the growth may be white, or rosaceous-white, or rosaceous-gray, and the vegetations be yellow. On the whole, however, gelatinous spots dotting the surface of the section are the best characteristic of this change. Now and then, or when great vascularity and the fatty and myxomatous degenerations are combined, there will be areas of yellow and red, and spots of brown pigmentation, along with gelatinous dots. In point of fact, the color is so variable that it is extremely difficult to give an intelligible description of it. It need scarcely be added that melanotic sarcomata are pervaded by areas of dark brown or black pigmentation. The cut surfaces of many of the largest specimens have also a lobed appearance from the close packing of the vegetations in the enlarged ducts which play the part of capsules.

The gross characters of the smaller tumors, which correspond to the adenoid sarcomata of Billroth, and which do not grow larger than a walnut in seven or eight months, are worthy of notice, as they differ from fibromata of the same dimensions in several particulars that are useful in establishing a differential diagnosis. Thus, of the five specimens of adenoid spindle-celled growths which I have extirpated, all were lobulated, firm, elastic, adherent to the gland, grayish-white in color, and tough on section. The fibromata, on the other hand, were hard, merely nodular, less adherent to the mamma, white, and more compact and tough on section. Under the microscope, the glandular elements were undergoing obliteration to a greater extent in the former than in the latter.

Inflammation and suppuration of mammary sarcoma are infrequent, but ulceration of the overlying tissues is so common that it occurred in twenty-nine, or 18.59 per cent., of the one hundred and fifty-six cases that I have collated, a proportion which is more than double that met with in fibroma. As is witnessed in the latter tumor, the ulceration appears to be the result rather of inflammation and gangrene, or merely rupture, of the attenuated skin, than of its infiltration by sarcomatous cells; but in one case it depended upon exploratory puncture. In some examples it is, doubtless, due to invasion of the skin, but only one case, that of a crater-like ulcer, appears to have originated in this way. In 10 per cent. of the cases the ulcer presents itself in the form of a sloughing patch. Fungous protrusion almost invariably follows the perforation of the integuments, although in a remarkable instance recorded by Ashhurst,[1] the recurrent growth of which I exhibited at the Pathological Society, the ulcer subsequently healed. The protruding mass, which is usually an intracystic growth, varies in size from a hazelnut to three, four, and even five inches in diameter, and exhales a sanguinolent and fetid discharge, which may become more or less purulent from inflammation induced by exposure and friction. It is not, however, very prone to free hemorrhage or sloughing. The ulcer itself is usually circular, and the surrounding skin is not only, as a rule, free from discoloration, but it is also unattached to the fungus, and everted, or rather elevated, on its sides. Now and then there are several ulcers, separated by bridges of sound tissue. From a diagnostic standpoint, it is worthy of notice that ulceration occurred in 7.69 per cent. of solid sarcomata, against 18.76 per cent. of cystic sarcomata, and that it was met with in 25 per cent. of the giant-celled, 23.58 per cent. of the round-celled, and 17.58 per cent. of the spindle-celled tumors.

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[1] Trans. Path. Soc. Phila., vol. v. p. 230.

Sarcomata of the breast are generally solitary, since I find of one hundred and fifty-six cases that only ten were multiple, several growths existing in one gland in seven and in both glands in two, while in the tenth instance four tumors were present in one breast, and one tumor was found in its fellow. Their most common seat is in the vicinity of the nipple, and, when they arise from the circumference of the organ, they are usually found at its upper and outer quadrant. When of central origin they are, for the most part, cystic; while they are usually solid when they start from outlying lobules. In either event they evince a marked disposition to extend beyond the limits of their capsules, those of central origin gradually invading the entire gland, and the surrounding soft parts, while the peripheral ones not only infect the latter structures, but also finally implicate the entire breast. As a rule they give rise to broadly based hemispherical tumors, but they are now and then pedunculated.

They occur as early as the ninth and as late as the seventy-fifth year, the average age of their first observation being 40.6 years. Of 148 cases in which the age is recorded,

1 appeared at 9 years.
14 " between 10 and 19 years.
16 " " 20 " 29 "
40 " " 30 " 39 "
39 " " 40 " 49 "
23 " " 50 " 59 "
14 " " 60 " 69 "
1 " at 75 years.

Of the entire number only 4, or 2.70 per cent., occurred before the sixteenth year, or during the developmental state of the mamma; 67, or 45.27 per cent., appeared between the sixteenth and fortieth years, or at a period when the breast and genitalia are functionally most active; and 77, or 52.02 per cent., after the fortieth year, or during the period of their functional decline. Spindle-celled tumors develop earlier in life than the giant-celled and round-celled, since the average age at which they were noticed was 36 years and 7 months, against 47 years and 3 months for the giant-celled, and 48 years for the round-celled. Unlike cystic and solid fibromata, cystic sarcomata appear at an earlier age than solid sarcomata, the average for the cystic being 38 years and 5 months, against 43 years for the solid variety. Hence it may be said that spindle-celled and cystic sarcomata are metaplasias of the functionally perfect mamma, and round-celled, giant-celled, and solid sarcomata are metaplasias of the declining gland. In point of fact, the fifteen sarcomata occurring before the age of twenty were spindle-celled in fourteen.

Thirty-three of the patients were single and fifty-seven were married when the tumor was first noticed, while the social condition is not noted in the remainder. Of the married women forty were multiparous, six had one child, and eight were barren; while the question of children is not stated in three. In two cases the disease showed itself during pregnancy, and in four soon after parturition. Of thirty-eight subjects in which the menstrual function is recorded, all were regular save one, who suffered from amenorrhœa. In seventeen instances, or one in every nine and one-third, injury was assigned as the cause of the tumor; in one it developed at the site of an abscess; in one it was preceded by psoriasis of the nipple; while in none was it inherited. These facts show that the etiology of sarcomata is most obscure, since their development is rarely traceable to injury or disease, and is not influenced by hereditary predisposition, while the social state and menstrual irregularities or arrest are surely unimportant agents in their production.

The increase of sarcomata is more rapid than that of the other connective tissue neoplasms, but it is liable to great diversity, being independent of the age of the subject, and influenced by their structure, by their degenerations, and by the absence or presence of cysts. Of the solid sarcomata I have met with six examples which varied from one to two inches in diameter in five, six, seven, and eight months; and, even at the end of two or three years, they may not be larger than an apricot[1] or a turkey's egg,[2] although they may, in their pure state, attain the volume of an adult head in four months,[3] or a circumference of twenty-five inches and a weight of four pounds and two-thirds in nine months.[4] When they are the seat of myxomatous degeneration or of softening cysts, they may weigh four pounds and twelve ounces,[5] or measure twenty-three inches in circumference and weigh six pounds, in four months.[6] Of the cystic, as of the solid, variety, I have seen examples in which it did not exceed a diameter of two inches in five and eight months; while it is rarely larger than a fist in one year. In exceptional instances, however, it may attain the volume of a double fist in three months,[7] or a weight of upward of ten pounds in the same number of months,[8] or a circumference of thirty-one inches and a weight of twelve pounds in one year.[9] As an evidence of its unequal rate of progress, we may state that it may require eighteen months,[10] five years,[11] eighteen

[1] Reverdin: Bull. de la Soc. Anat., t. xlii. p. 708, and t. xliv. p. 285.

[2] Zamblanchi: Ibid., t. xlvi. p. 314.

[3] Billroth: Chir. Klinik, Wien, 1869–70, p. 142.

[4] Bryant: Trans. Path. Soc. London, vol. xix. p. 387.

[5] Bennett: Cancerous and Cancroid Growths, pp. 12 and 256.

[6] Hewson: Gross's System of Surgery, 6th ed., vol. ii. p. 974.

[7] Post: Medical Record, 1872, p. 112.

[8] Glück: Langenbeck's Archiv, Bd. viii. Jahresbericht, p. 599.

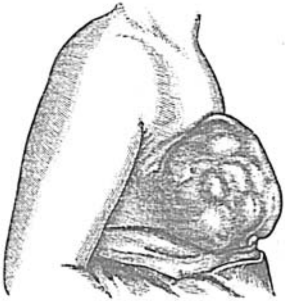
[9] Pitha: Ibid., p. 599.

[10] Hubert: Bull. de la Soc. Anat., t. xlviii. p. 690.

[11] Reverdin: Ibid., t. xliv. p. 281.

years,[1] or forty years[2] to reach the volume of a fœtal head, or six years[3] or fifteen years[4] to attain the size of an adult head.

Like the cystic fibromata, sarcomata may remain stationary and of small dimensions for a long time, when, without obvious cause, they suddenly begin to increase, so that a nodule that has required fifteen years to attain the volume of a walnut reaches that of a double fist in three months;[5] or one which has remained the size of an egg for eighteen years, acquires the volume of an adult head in a few months;[6] or one that has been quiescent and of the size of a walnut for twenty-five years, suddenly begins to grow, and measures eighteen inches transversely by fourteen inches and a half vertically in three years;[7] or one that has been a year and a half in acquiring the volume of an egg grows to a circumference of twenty-six inches, and a weight of seven pounds in an additional six months.[8] In such cases rapid accumulation of fluid and solid contents in the dilated ducts may be looked for; or the increase in volume may be due to myxomatous changes and interstitial hemorrhage. Under similar circumstances their progress may be interrupted, of which I recently met with a notable example. On the 11th of November, 1886, I removed a proliferous cystic small spindle-celled tumor from a lady of sixty-five. At the age of twenty-five, she accidentally observed a tumor as large as a chestnut at the inner side of the right nipple. It remained of that size until the age of sixty-one, when it began to grow, and during the past year had doubled its volume, so that it was larger than a fœtal head. Its gross characters are shown in the illustration, and the breast



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[1] Pick: Trans. Path. Soc. London, vol. xx. p. 347.

[2] A personal case.

[3] Hubert: Ibid., t. xlvii. p. 369.

[4] Berbèze: Ibid., t. xii. p. 94.

[5] Marignac: Bull. de la Soc. Anat., t. iii. p. 428.

[6] Tillaux, quoted by Cordier: Thèse de Paris, 1880, No. 494, p. 16.

[7] Anderson: Trans. Path. Soc. London, vol. xxiii. p. 254.

[8] Marchand: Gaz. des Hôpitaux, 1869, No. 51, p. 196.

measured seven inches more in circumference than its fellow. Robin[1] has recorded a case in which a vegetating myxomatous spindle-celled tumor remained of the size of a hazelnut for six years, when it grew continuously for four years, and reached the volume of a fist, and then doubled its size in three years and a half, and during the last six months, or fourteen years from its first appearance, attained a weight of nine pounds. Tillaux[2] extirpated a cystic tumor which grew from the size of a filbert to a hen's egg in three years, at which size it remained stationary for four years, when in six months it acquired the volume of an adult head. Although these seven cases were examples of cystic tumors, their peculiar histories countenance the view held by Billroth, Labbé[3] and Coyne,[4] König,[5] Duplay,[6] and myself, that fibroma is frequently metamorphosed into sarcoma through multiplication of its cells and increased vascularization. The opponents of this view of a change of type may urge that a sarcoma may remain latent for many years, when, without obvious cause it begins to grow rapidly; but there is certainly no reason why a fibrous tumor should not serve as the mother tissue of a sarcoma as well as ordinary fibrous tissue. Be this as it may, a long period of quiescence and intermission of growth are not infrequent in sarcoma, and are of diagnostic value when compared with the progress of other neoplasms of the breast. As occurs in fibroma, continuous growth rather indicates freedom from cysts and vegetations, while sudden and rapid increase points to fluid accumulation and intracanalicular vegetations.

The growth of sarcomata might naturally be expected to be connected with menstruation, pregnancy, or lactation, or with conditions which render the mammary gland more vascular; but the influence of an increased flow of blood to the organ, which has been assumed by certain authors, is not confirmed by an analysis of the cases that I have collected. Thus, in only three examples was an increase in bulk witnessed at the menstrual period, while in two the tumor became smaller. In one the rapid growth began during pregnancy, and in two at the menopause.

From these considerations it follows that, while sarcomata constitute the most bulky of the mammary neoplasms,[7] their growth is so capricious that an average rate of increase cannot be assigned to them. On the whole, however, one is justified in concluding that the small-celled, the cystic, the myxomatous, and the telangiectatic increase more rapidly than the large-celled, the solid, and the pure tumors.

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[1] Journal de l'Anat. et de Phys., t. x. p. 195, and Bull. de la Soc. Anat., t. xlviii. p. 817.

[2] Cordier: Thèse de Paris, 1880, No. 494, p. 7.

[3] Chir. Klinik., Wien, 1871–76, p. 261.

[4] Traité des Tumeurs Bénignes du Sein., pp. 269, 283, and 363.

[5] Lehrbuch der Spec. Chirurgie, 4th ed., Bd. 11, p. 89.

[6] Traité Élément. de Path. Ext., par Follin et Duplay, t. v. p. 628.

[7] In his inaugural dissertation, Ueber Fibro-Adenom der Mamma, Göttingen, 1878, p. 13, Watson narrates a case from the practice of Kremer, in which the tumor weighed twenty-two pounds. Péan, in his Leçons de Clinique Chir., t. ii. p. 90, describes a myxomatous cystic spindle-celled sarcoma which weighed ten kilos, or more than twenty-six pounds, and a similar weight is recorded by Cordier, in his Thèse de Paris, No. 494, 1880, p. 40, from the practice of Tillaux.

The active growth of the sarcomata is liable to be attended with marked elevation of the temperature, as was noted in two of my own cases, in one of which Seguin's surface thermometer indicated 100° against 95° for the opposite breast. In two other examples of cystic sarcoma there was an increase in the heat, as roughly estimated by the hand. All of these tumors were highly vascular and composed of small cells, so that elevation of the temperature may be said to be characteristic of telangiectatic and rapidly proliferating growths. Further investigations in this direction may prove useful in determining the differential diagnosis of the connective tissue neoplasms, and should not be neglected.

During their further progress sarcomata continue, as a rule, mobile and free from superficial or deep attachments; the contiguous structures are not invaded by tumor elements; the skin remains natural in color and texture; the subcutaneous veins are not enlarged; the nipple is normal; and the associated lymphatic glands are not contaminated. To these general statements some exceptions must be noted.

α. While it is not uncommon for recurrent tumors to be more or less closely fixed to the pectoral muscle, and through it to the walls of the chest, it is a singular fact that the primary growth is, almost without exception, freely movable, and rarely attached even to the common integument. In a case of spindle-celled tumor recorded by Zambianchi, and it was an example of two growths in the same breast, the outlying tumor developed over the upper costal cartilages to which it adhered, and sent a prolongation into the thorax.[1] In 6 additional instances, the muscles of the chest were involved in 5, and the parammary fat in 1. The tumor was cystoid spindle-celled in 1, cystic spindle-celled in 2, round-celled in 1, osteoid round-celled in 1, and cystic giant-celled in 1. Just how often the skin is invaded is difficult of solution, since in some of the cases of ulceration it was, doubtless, converted into sarcoma tissue, but microscopic data of this fact are wanting. Be this as it may, the skin was adherent in 15 examples, of which 10 were cystic, and 5 solid tumors, the round-celled slightly predominating. If, in addition to the cases of invasion of the muscles, perichondrium, and connective tissue, these 15 cases be regarded as instances of invasion by tumor elements, sarcomata of the breast are to be regarded as locally infectious in 14.19 per cent. of all cases.

β. Although the skin may be stretched and attenuated, and ulcerated,

[1] Ante: Lagrange and Duret (Bull. de Soc. Anat., t. xlviii. p. 516) refer to a case in which, on post-mortem examination of a female who had for many years an enormous sarcoma of the breast, the tumor separated the fibres of the pectoral muscles, passed between two ribs into the cavity of the mediastinum, and penetrated between and compressed the lobes of the lung, without infecting any of these structures.

as I showed in 18.59 per cent. of all examples, it was discolored in only 36, or in 23 per cent., and it is interesting to know that the changes in tint occurred twenty-seven times in the cystic and nine times in solid growths, three of which were the seat of degeneration-cysts, and that the round-celled tumors predominated. In twenty-one the tint was red, in four bluish, in ten violaceous, and in one livid.

γ. The superficial veins were enlarged in 24 instances, or in 15.39 per cent., but only to a slight extent in 2. In 18 the tumor was cystic, and in 6 it was solid, but in the latter it was the seat of extravasation of blood in one, and of mucoid cysts in the second. The spindle-celled growths predominated.

δ. The nipple was retracted or umbilicated in only 5, and these were examples of cystic growths.

ε. Of the 156 cases the lymphatic glands were enlarged, and now and then tender, in 19. In 14 of these the enlargement was associated with the primary growth, but in only 1, a case of alveolar pigmented round-celled sarcoma, were tumor elements detected.[1] In the remaining 5, the glands were extirpated along with recurrent growths, and in 2 of these, one an example of round-celled sarcoma communicated to me by Dr. Markoe, of New York, and the second a case of alveolar giant-celled tumor,[2] were they infected. Hence the glandular enlargement was due to irritative hyperplasia in 16, in 10 of which ulceration of the tumor was present, while they were infected in only 3. This immunity of the glands from contamination is remarkable, and is a valuable sign in the differential diagnosis of malignant mammary growths.

A discharge from the nipple is not met with in the solid tumors, but occurs in one case out of every nine and a half of cystic sarcomata, the proportion being smaller than is met with in cystic fibromata, and is of great value as a symptom of enlargement of the ducts, although it is of itself unimportant in the differential diagnosis. In two instances from the practice of Bryant,[3] the discharge was the first symptom, and preceded the detection of the tumor by three months in one and by two years in the other case. In a third case, recorded by that surgeon,[4] the flow was bloody, and derived from highly vascular vegetations. In the case of Hubert,[5] the tumor augmented in size at each menstrual period, when there was an occasional discharge of a citron-colored liquid. In the examples of Billroth[6] and Winslow,[7] in which the neoplasm developed during pregnancy, there was also a spontaneous escape of a serous fluid; while in those of Lebert[8] and Verneuil,[9] a viscid transparent liquid was expelled by pressure.

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[1] Billroth: Die Krankheiten der Brustdrüsen, p. 56.

[2] Ibid., p. 58.

[3] Guy's Hospital Reports, ser. 3, vol. x. p. 115, and ser. 3, vol. xxviii. p. 468.

[4] Ibid., vol. x. p. 120

[5] Bull. de la Soc. Anat., t. xlviii. p. 369.

[6] Chir. Klinik, Wien, 1869 and 1870, p. 142.

[7] Maryland Med. Journ., vol. 12, p. 243.

[8] Physiologie, Pathologique, t. ii. p. 128

[9] Valude: Thèse de Paris, 1885, No. 91, p. 131.

The growth of sarcomata is attended with pain in 35.71 per cent. of all cases. In only 2.67 per cent., however, was attention first called to the tumor by suffering, and, in the remainder, it declared itself later, and varied in character and frequency in accordance with the variety of the sarcoma. Thus, in the solid form it was experienced in only 28 per cent. of the cases, and of these it was lancinating and continuous in 42.85 per cent., of an occasional darting character in 28.57 per cent., and lancinating and continuous only during the rapid increase of the tumor. In the cystic variety, on the other hand, it was felt in 41.93 per cent. of the cases, and in 69.23 per cent. of these it was, as a rule, severe and lancinating, and came on late in the disease, especially during rapid growth, when the tumor became tense through the increase of the contents of the cysts; while it was continuous and lancinating in 11.53 per cent., and slight in 19.23 per cent. In 14.28 per cent. of all cases it was only experienced when ulceration had set in, but ulceration and fungous protrusion provoked suffering in only 35.72 per cent. of all instances, and rarely increased it when it was previously felt. In one instance it was experienced only at the menstrual periods; while in three it was aggravated, and in one diminished, at that period. In only five cases was the growth absolutely tender, although in many examples it was annoying from its weight and bulk, so much so, indeed, in a case recorded by Pick, that the woman repeatedly tapped the cyst with a penknife to rid herself of these features.

During their further progress, as we have already seen, sarcomata may invade their limiting capsules and the neighboring tissues, and finally ulcerate. Without, however, of necessity pursuing this course, their capsules may remain intact, but none the less may they extend to the adjacent structures along the course of the bloodvessels, the adventitia of which is frequently the seat of small-celled proliferation, through which the tissues are converted into "latent zones of infection;" these zones are not appreciable by the naked eye, but serve not only as the points of departure of the recurrences that are so often witnessed after their removal, but also as foci of general infection with the production of deposits in the internal organs. Hence it is that the prognosis of sarcomata is eminently unfavorable, although there is still no little diversity of opinion among practical surgeons and pathologists on this point. Thus, Wilks and Moxon,[1] Cornil and Ranvier,[2] Labbé and Coyne,[3] and Erichsen[4] regard them, and particularly the cystic form, as being comparatively innocent, and only marked by a tendency to local reproduction. Labbé and Coyne and Erichsen deny the possibility of the general dissemination of spindle-celled tumors; and Erichsen, indeed, advances the doctrine that "the tendency to recurrence will, in most cases, gradually wear itself out, and after several operations have been required at intervals of months, or a year or two, the disease will cease to be reproduced, and a cure will be thus established;" although, he adds, that "instances are not wanting in which the tendency to the local reproduction of the sarcoma has been so active that it outran all possibility of complete extirpation, and eventually destroyed the patient." Virchow[1] states that, while sarcoma may recur in loco, "it is a tumor of limited malignity, but fully capable of producing metastases;" and Lücke[2] indorses this view. Birkett,[3] Gross,[4] Ashhurst,[5] Klebs,[6] Billroth,[7] Annandale,[8] Winckel,[9] and Agnew,[10] on the other hand, fully recognize the malignant attributes of sarcomata as denoted by their capability of reproducing themselves, not only in the neighboring tissues, but also in remote parts; and other writers regard their progress as being "much more favorable" than that of mammary carcinoma.

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[1] Lectures on Path. Anatomy, p. 584, 1875.

[2] Manuel d'Histologie Pathologique, p. 1162.

[3] Op. cit., p. 431.

[4] The Science and Art of Surgery, 8th Amer. ed., vol. ii. p. 710.

The greatest obscurity exists in regard to the cystic sarcomata, which include the tumors in which the dilated ducts are more or less closely filled with vegetations. This uncertainty is due to the fact that many English and German pathologists and surgeons class cystic adenomata, cystic fibromata, and cystic myxomata under the term cystic sarcoma. Marcus Beck,[11] the latest writer on the subject, indeed, denies the presence of duct cysts in sarcoma.

In 1880 I certainly established the fact that all the varieties of sarcoma of the breast are malignant; and a careful study of 92 of the 156 cases upon which this paper is based, and in which the final reports extend beyond the mere statement of the recovery or death of the patient, confirms this view.

Of the 92 cases only 1 ran a natural course, it being an example of round-celled tumor of both breasts, that proved fatal, with presumed secondary deposits, in seven months from the first appearance of the disease. The remaining 91 were subjected to the knife. Of these, 32 were well for periods which varied between one month and ten years and nine months; 42 were marked by local recurrence; in 8, not only was there regional reproduction, but metastases were found post-mortem; 3 recurred, with unmistakable evidences of general dissemination; 4 were characterized by metastases, and 2 by presumed metastases, without recurrence. In other words, 64.83 per cent. of these cases were endowed with malignant features. Let us examine these general statements more in detail.

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[1] Op. cit., p. 302.

[2] Pitha and Billroth's Hdbch. der Allg. und Spec. Chir., Bd. ii., Abth. i., p. 194.

[3] A System of Surgery, edited by Holmes and Hulke, 3d ed., vol. iii. p. 451.

[4] System of Surgery, 6th ed., vol. ii. p. 973.

[5] Phila. Med. Times, vol. ix. p. 384, 1879.

[6] Op. cit., p. 1118.

[7] Die Krankheiten der Brustdrüsen, p. 60.

[8] Internat. Encyclop. of Surgery, vol. v. p. 842.

[9] Lehrbuch der Frauenkrankheiten, p. 754.

[10] Princ. and Pract. Surgery, vol. iii. p. 702.

[11] Dictionary of Practical Surgery, edited by Heath, p. 183.

32 patients were alive and well for an average period of 49 months and 10 days after operation, the disease having existed, on an average, for 69 months and 11 days before surgical interference, so that the mean life of these subjects was nearly ten years. The period of freedom from recurrence was

From	1	to	12 months,		in	4	cases.[1]
"	1	"	2 years,		"	4	"
"	2	"	3 "		"	7	"
"	3½	"	4 "		"	5	"
"	4	"	5 "		"	5	"
For	7	years and	3	months	"	1	case.
"	8	"			"	1	"
"	9	"	" 11	"	"	1	"
"	10	"			"	1	"
"	10	"	" 4	"	"	1	"
"	10	"	" 5	"	"	1	"
"	10	"	" 9	"	"	1	"

As has been seen, there was local reproduction in 53 cases. In 45, in which the date is noted, the periods of recurrence were as follows:

2	cases	in	3 weeks.	3	cases	in	12 months.
2	"	"	1 month.	1	case	"	15 "
7	"	"	2 months.	1	"	"	17 "
3	"	"	3 "	2	cases	"	18 "
2	"	"	3½ "	1	case	"	20 "
2	"	"	4 "	1	"	"	21 "
5	"	"	5 "	3	cases	"	24 "
3	"	"	6 "	1	case	"	29 "
1	case	"	7 "	1	"	"	32 "
1	"	"	8 "	1	"	"	36 "
1	"	"	9 "	1	"	"	48 "

The table shows that more than one-half, or 57.7 per cent., of the reproductions took place in 6 months, while after 12 months there were only 13, or 28.8 per cent., and of these there were only 4, or 8.8 per cent., after 2 years. These statements lead to the belief that the chances for the patient are relatively good after the lapse of 2 years, and that the prognosis is all the more favorable as the period of freedom from signs of local contamination prolongs itself. As the latest date of reproduction was 4 years, we may assume that the 12 cases of the first table which remained well after the lapse of that time were permanently cured. The average date of recurrence was 10½ months, and the total life of these patients from the first observation of the disease to the final report after the last operation was 7 years and 9 months. The number of recurrences, or operations for recurrence, was 1 in 23 cases, 2 in 13 cases, 3 in 7 cases, 4 in 1 case, 5 in 4 cases, 6 in 2 cases, 7 in 1 case, 12 in 1 case, and 22 in 1 case.

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[1] The shortest periods were 1 month, 4, 6, and 10 months.

While the average was 10½ months, the histological constitution of the growth appears to have exerted a marked influence upon the date of recurrence. Thus, the average date of local reproduction was 4 months and 20 days for the round-celled, 11 months and 27 days for the spindle-celled, and 12 months and 10 days for the giant-celled. The cystic tumors recurred in 8 months and 5 days, and the simple in 13 months and 9 days, and this contrast becomes the more striking when we state that the average date of recurrence for cystic round-celled growths was 3 months and 4 days as against 6 months and 8 days for the simple round-celled, and 9 months for cystic spindle-celled as against 16 months for the simple spindle-celled.

Of the 91 cases metastatic growths, as demonstrated post-mortem, or by unmistakable evidences during life, had formed in 17, or 18.68 per cent. There can be no doubt that this estimate is too low, since of 20 examinations of persons dead from the effects of the primary operation, or dead after secondary operations, metastatic growths were found in 12, or 60 per cent. The total duration of life from the first appearance of the primary tumor to the death of the 17 patients was 57 months, 9 months having been the shortest, and 25 years and 7 months, the longest, period. The relative frequency of the seats of the secondary deposits is shown by the following statement:

Lungs,	in 10 cases.	Pleura,	in 1 case.
Liver,	" 4 "	Heart,	" 1 "
Brain,	" 3 "	Kidney,	" 1 "
Dura mater,	" 1 case.	Muscles,	" 1 "
Retroperitoneal glands	" 1 "	Bones,	" 1 "
Mediastinum,	" 1 "		

The prognosis is materially influenced by the age of the patient and by the size and rate of increase of the tumor. Thus before the age of thirty-five, when the mammary gland is functionally most active, a small, slowly growing sarcoma does not return, while a rapidly increasing tumor, especially the cystic variety, is very liable to recur. Among the latter class of cases, 60.71 per cent. were characterized by recurrence, and 10.71 per cent. by metastatic tumors. Of these, the solid sarcomata recurred in 53.84 per cent., and gave rise to secondary growths in 7.69 per cent., while the cystic recurred in 66.66 per cent., and were marked by metastases in 13.33 per cent. It does not appear, however, as many writers assert, that the more tender the age the more rapid is the growth of, and the more malignant is, the neoplasm. Thus, of 15 cases, the ages of which varied from 9 to 19 years, or 16½ years on an average, the tumor had been in existence on an average for 7½ years before its removal, and 28.57 per cent. remained well, while 71.43 per cent. recurred, and metastases were not observed in a single instance. After the thirty-fifth year, on the other hand, and the danger increases with advancing age, the greater is the liability to metastases, as in this class of cases 19.35 per cent. were generalized, and 43.54 per cent. recurred. Of these, the solid tumors recurred in 47.05 per cent., and gave rise to secondary growths in 23.54 per cent., while the cystic recurred in 44 per cent., and were marked by metastases in 16 per cent. of all cases. In other words, a sarcoma occurring in a functionally active breast evinces a marked disposition to recur after operation, with less disposition to metastases, while a sarcoma of the declining breast recurs less frequently, but is generalized in a greater number of instances.

The prognosis is also influenced by the histological constitution and the stage of evolution of the tumor. Of the spindle-celled 65.10 per cent. recur, and 20.40 per cent. give rise to metastatic growths; of the round-celled 60 per cent. recur, and 25 per cent. are generalized; of the giant-celled 57.14 per cent. recur, and in none are there metastases; of the solid 64.58 per cent. recur, and 25 per cent. are disseminated; while of the cystic 51.16 per cent. recur, and 11.62 per cent. are generalized. Hence, while the round-celled are the most malignant, the metastasis of the spindle-celled is by no means to be denied, nor can we say, with certain writers, that the cystic variety is an innocent tumor, or one of limited malignity, since it recurs in more than one-half of all cases, and generalizes itself in about one case out of every nine. These investigations demonstrate that the usual statements, which are so opposed to the actual facts, as to the malignity of sarcomata, are due either to their not having been based upon a careful analysis of a sufficient number of recorded cases, confirmed by minute examination, or to the confounding of cystic sarcomata with other cystic growths, which never infect the economy.

While I have been unable to collate cases in which the disease ran a natural course, through which we are deprived of data bearing upon the duration of life in this class of patients, and comparing them with the average duration of life of those subjected to the knife, there can be no doubt that operations do result in permanent recoveries, and prolong life, even if a final cure is not attained. From an inspection of the two tables on a previous page, it appears that recurrence may be delayed for four years, and that 12 subjects were alive and well after four years, so that if we take four years as the criterion of safety, the 91 operations show 13.18 per cent. of cures.

Although the recurrent regional disease is more intense than the primary, and other reproductions generally follow in quick succession, the removal of tumors as fast as they appear certainly alleviates suffering, prolongs life, averts visceral contamination, and occasionally brings about a cure. Thus, Bryant[1] removed the entire breast for a round-celled sarcoma on January 9, 1883, and up to February 10, 1886, performed twelve operations for multiple recurrent growths, the opposite breast being the seat of an atrophic scirrhus of sixteen years' standing. Billroth[2] enucleated a cystic sarcoma, and removed four recurrent growths in four years, the breast being extirpated at the last operation, and the woman was free from disease three years subsequently. Erichsen[3] extirpated the entire breast for a cystic growth of twenty-seven years' standing in 1859, and removed recurrent growths in 1861, 1863, 1864, 1865, and 1866, death ensuing from paralysis "some years after the last operation." In Heath's[4] case of removal of the gland for a spindle-celled tumor, six operations for recurrences were done in thirteen years, and the patient was alive with a seventh recurrence. In that of Haward,[5] a spindle-celled tumor was removed in 1860, and recurrent growths were excised in 1863, 1869, and 1873. The patient died, without metastases, from the effects of the last operation, but life was prolonged, as in the preceding instance, for thirteen years. Riedel[6] removed six recurrences in twenty years following an operation for giant-celled sarcoma, and on death there were no metastases. Gay,[7] in May, 1865, enucleated from the same breast two cystic spindle-celled sarcomata of six years' standing. Recurrent growths were removed in July, 1867, with the entire gland, in May, 1869, and May, 1874, in June, 1878, in May, 1880, and in June, 1881, so that life was extended for fourteen years, and the woman was still living at the date of the last report. The case of S. D. Gross,[8] however, is, so far as I know, the most remarkable on record. In March, 1857, a single woman, aged forty-four, discovered a small tumor in the left breast, which, on enucleation the following October, proved to be a small spindle-celled sarcoma. During the next sixteen months two more partial operations were performed, and a fourth tumor, along with the entire breast, was extirpated in May, 1859. In three months and a half the knife was again required, and soon afterward other tumors were removed. In 1860 she underwent eleven operations, and six in 1861, the last of which was performed in September of that year, so that she was subjected to twenty-two operations for fifty-one recurrent tumors in four years. They varied in size from an almond to a hen's egg; appeared at or near the cicatrices in a few weeks, and rapidly assumed a fungating aspect. Large portions of the pectoral, and also of the external and internal intercostal muscles were cut away, so that during a deep inspiration there was a slight protrusion of the pleura. Ten years and nine months after the last operation she was in perfect health. In these eight cases there was no lymphatic involvement, and the general health was unimpaired.

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[1] Private communication, March 6, 1886.

[2] Die Krankheiten der Brustdrüsen, p. 68.

[3] The Science and Art of Surgery, 8th Amer. ed., vol. ii. p. 711.

[4] British Medical Journal, 1878, vol. i. p. 194.

[5] Trans. Clin. Soc. London, vol. vii. p. 106.

[6] Centralblatt für Chirurgie, 1881, Bd. 8, p. 636.

[7] Trans. Path. Soc. London, vol. xvi. p. 240; vol. xx. p. 359; vol. xxv. p. 233; vol. xxxi. p. 272; and vol. xxxiii., Suppl. p. 24.

[8] A System of Surgery, 6th ed., vol. ii. p. 974.

A study of the preceding facts shows that, like carcinoma, sarcoma is a malignant growth. It differs, however, from the former in many important features, which are shown in the following statement:

	Sarcoma.	Carcinoma
Invasion of the skin by tumor elements	9.67 per cent.	68.92 per cent.
Invasion of the chest walls	3.87 "	21.58 "
Invasion of the parammary connective tissue	0.64 "	8.39 "
Primary invasion of the axillary glands	0.64 "	67.35 "
Local reproduction after removal	58.24 "	80.97 "
Metastases found post-mortem	60.00 "	50.00 "
Average duration of life	81 months.	39 months.
Permanent cures	13.18 per cent.	10.39 per cent.

From this table it appears that sarcoma is less infectious locally, but more infectious as regards the general system, than carcinoma. Its more relatively benign character is shown not only by the larger proportion of cures, but also by the fact that the average duration of life, from the first observation of the disease to the date of the last removal after operation, is forty-two months longer; and this contrast becomes the more striking when it is stated that the majority of the sarcomatous patients were still living, and the majority of the carcinomatous subjects were dead. Not only is this statement true for sarcomata in general, but it holds good for the three varieties, since the average life for round-celled sarcoma is fifty-four months, ninety months for the spindle-celled, and one hundred and eight months for the giant-celled.

The diagnosis of small, slowly increasing fibrous sarcomata is by no means easy, as they are very liable to be confounded with fibromata, particularly when they arise at the circumference of the mamma. A tumor, however, of soft, apparently fluctuating consistence, with elevated temperature, conveying the impression of an abscess, and occurring in young women, which attains a large volume in a few months, can scarcely be anything else than a medullary sarcoma. On the whole, the diagnosis is based upon their indolent origin, mobility, elastic, or unequal consistence, lobulated outline, rapid increase, freedom from lymphatic involvement, their tendency to ulcerate, the not infrequent discoloration of the skin, and enlargement of the subcutaneous veins, and, possibly, elevation of temperature; upon the suffering which they awaken late in the disease; and upon their greatest frequency after the fortieth year.

The only tumors met with before the age of sixteen are fibromata and sarcomata, the former being twice as common as the latter. The fibromata are always solid, and grow slowly, while the sarcomata are cystic in three-fourths of all instances, and medullary in the remaining fourth, and, as a rule, grow rapidly. Hence cystic and medullary tumors at this period of life are sarcomata and nothing else.

Between the spindle-celled, round-celled, and giant-celled there are some marked similarities which render their differentiation difficult. The spindle-celled, however, are characterized by their development at a comparatively early age; by the attendant suffering; by the enlargement of the subcutaneous veins; by their slow reproductiòn after removal; and by their long life. The round-celled, on the other hand, appear, as a rule, at a comparatively late age, and are painless; but the skin is liable to be discolored and ulcerated, and recurrence is rapid, and the duration of life is relatively short. The giant-celled likewise appear late in life, but are painful; discoloration of the skin and ulceration are also common; but there is no enlargement of the veins, while irritative enlargement of the axillary glands is frequent. Local reproduction is delayed longer than in the other varieties, and the duration of life is remarkable.

These points are set forth in the following table, in which the affinities and contrasts of the three principal varieties may be seen at a glance:

	Spindle-celled.	Round-celled.	Giant-celled.
Average age of appearance . .	36 years.	48 years.	47 years..
Appear before 16th year . .	12.08 per ct.	0.83 per ct.	0 per ct.
Pain	60.00 “	10.81 “	43 “
Skin discolored	20.88 “	32.35 “	25 “
Ulceration	17.58 “	23.58 “	25 “
Veins enlarged	17.58 “	11.76 “	0 “
Glands swollen	6.59 “	8.82 “	37.5 “
Glands infected	0. “	2.94 “	0. “
Adjacent tissues invaded . .	13.18 “	17.64 “	25 “
Local reproduction . . .	65.10 “	60. “	57.14 “
“ “ average date of	12 months.	4⅔ months.	12⅓ mos.
Metastatic deposits . . .	20.40 per ct.	25 per ct.	0 per ct.
Average life with operation . .	90 months.	54 months.	108 mos.

Between the solid and cystic varieties there are certain distinctions, which are useful in establishing a differential diagnosis. The former develop at about the forty-third year; the skin is discolored in 11.53 per cent; ulceration occurs in 7.69 per cent.; the veins are dilated in 7.69 per cent.; there is no discharge from the nipple, nor is it retracted; pain is met with in 28 per cent.; the surrounding tissues are invaded by tumor elements in 11.54 per cent.; the lymphatic glands are enlarged in 11.54 per cent., and infected in 1.28 per cent.; recurrence ensues in 64.58 per cent., and metastatic growths are met with in 25 per cent. of all instances. Cystic sarcoma starts, as a rule, at the thirty-eighth year, and is not, as is asserted by many writers, most common between twenty and thirty-five years, as just as many cases occur after as before the latter age; it grows more rapidly than the solid variety, and its increase is often sudden after having remained stationary or advanced slowly for some time. Now and then, after evacuation of the fluid of the superficial cysts, their solid contents can be detected by manipulation; their consistence is, as a rule, unequal, and they are more largely lobulated than the former variety. The skin is discolored in 34.61 per cent.; the tumor ulcerates in 18.76 per cent; the veins are enlarged in 23.07 per cent.; the nipple is retracted in 6.41 per cent., and discharges fluid in 10.25 per cent; pain is experienced in 41.93 per cent.; the adjacent tissues are infected in 16.66 per cent.; the lymphatic glands are swollen in 5.12 per cent., but they are never invaded by tumor elements; while it recurs in 51.16 per cent., and becomes generalized in 11.62 per cent. of all cases.

There are no signs by which cystic sarcomata can be absolutely differentiated from cystic fibromata, with which they are so frequently confounded. The latter develop earlier in life, and a discharge from the nipple is more common than in the former; but ulceration and enlargement of the veins are only one-half as frequent, and they are not attended with glandular enlargement or malignant features. It should, however, be stated that the largest proliferous cystic tumors met with in old, married multiparæ are generally sarcomata

As no attempt has hitherto been made to describe the life history of the giant-celled variety, and some of the modified forms of mammary sarcoma, the following facts will be found to be not devoid of interest.

In 8 cases of giant-celled tumors that I have collated, the average date of their first observation was 47¼ years, or at the ages, respectively, of 42, 45, 45, 46, 46, 49, 50, and 55. Of the 6 cases in which the social condition is noted, 3 were married, of which 2 were parous, and 3 were single. The tumors were solid in 6, of which one was alveolar, and cystic in 2. The skin was violaceous in tint and adherent in one case of cystic tumor, and red and stretched in one of solid tumor. In one of the cystic tumors there was firm attachment to the great pectoral muscle. Ulceration was met with in 3, of which 2 were solid and 1 was cystic. The axillary glands were enlarged but not infected in 3 cases, 2 of which were cystic and 1 was solid, and enlarged lymphatic glands were detected in 3 cases of recurrence of solid tumors, in 1 of which, an alveolar growth, they were invaded by tumor elements.

All of the cases were subjected to the knife. In 1 the history ceases with the operation.[1] In 3 there was no recurrence, and the patients were alive subsequently for ten years and five months,[2] three months,[3] and ten years.[1] In 4 the tumor recurred. In Billroth's[2] case, a reproduction, with infected glands, was removed in two months, and another similar operation was performed in a few months. The patient died of erysipelas, but metastases were not found post-mortem. In the case of Riedel,[3] six recurrent growths were removed in twenty years, and on death it was found that the patient was free from metastases. In the case of Estlander,[4] a recurrent growth, along with the glands of the axilla, was removed in two years and five months, and the patient was well five years and nine months subsequently; while in the case of Stanley,[5] the patient died with a recurrent tumor in two years after the extirpation of the breast. The average total duration of life of these patients from the first observation of the disease to the final report was nine years.

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[1] Estlander: Rev. Mens. de Méd. et de Chir., 4, 1880, p. 795.

[2] Ibid., p. 796.

[3] Lancereaux: Bull. de la Soc. Anat., t. xxxv. p. 292.

It will thus be seen that giant-celled, or myeloid, sarcoma sets up irritative enlargement of the lymphatic glands in 37.5 per cent. of all cases; that the skin is discolored, the tumor ulcerated, and the surrounding tissues are infected in 25 per cent.; that the subcutaneous veins and nipple are normal; and that, while it recurs in 57.14 per cent., it never gives rise to metastatic growths.

Osteoid sarcoma, or the variety which contains true osseous tissue, has been met with at the ages of 27, 46, 49, and 51 years, the average being 43 years. It occurs usually in married multiparæ; as a rule grows slowly; is hard, except when it has undergone cystoid degeneration; acquires large dimensions in one-half of the cases, and is painful during its rapid growth. It ulcerates in one-fourth of all instances; invades the adjacent tissues in one-half; does not infect the lymphatic glands, nor is it marked by dilatation of the superficial veins.

The case recorded by Durham[6] is devoid of further history. Of the three reported by Stilling,[7] in which an operation was practised, one died in twenty-three months, without recurrence, but with evidences of metastatic growths in the lungs and pleuræ; one died of pneumonia on the third day, with secondary tumors of the lungs, and sarcomatous thrombosis of the veins of the pectoral muscle, the disease having existed for eighteen months; and the third was characterized by two local reproductions, and a metastatic growth of the left ventricle of the heart, about sixteen weeks after the primary operation, the total life having been ten years and four months. The average life of these cases from the first observation of the disease until its termination was fifty-seven months, and the average life after operation was thirteen months and a half. Hence, metastases occurred, or were presumed to have occurred, in all the cases, and of those who survived the knife local reproduction was witnessed in one-third, and a recurrent growth would certainly have been formed if the patient with sarcomatous pectoral veins had survived. From these considerations, osteoid sarcoma must be regarded as the most malignant of the mammary sarcomata.

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[1] Paget: Trans. Clin. Soc. London, vol. vii. p. 108.

[2] Die Krankheiten der Brustdrüsen, p. 58.

[3] Centralblatt für Chirurgie, 1881, No. 40, p. 636.

[4] Ut supra.

[5] Paget: Lect. on Surg. Path., 3d ed., p. 555.

[6] Trans. Path. Soc. London, vol. xxxv. p. 378.

[7] Deutsche Zeitschrift für Chirurgie, Bd. xv. pp. 247-253.

The life history of pigmented alveolar round-celled sarcoma can only be based upon two cases. In that of Billroth,[1] a hard tumor, of three years' duration, as big as a child's head, and adherent to the skin, was removed, along with infected glands, from a multipara sixty-five years old. The patient died of exhaustion, without recurrence, in eight months, but there was no post-mortem examination. In the case of Butlin,[2] a tumor of seven years' standing was removed, in 1880, from the otherwise normal breast of a woman of fifty-eight. Recurrent growths were extirpated in 1882, 1884, and 1886, but the history ceases with the last operation. In addition to these cases, Wacker[3] describes a case of multiple melanotic alveolar round-celled sarcoma of both breasts, with infection of the glands of the left axilla, and metastatic tumors of the spleen, mesenteric glands, and brain. The disease was thought to be secondary to melanotic sarcoma of the skin of the mammæ. Winckel depicts a proliferous myxomatous melanotic sarcoma, but the case is devoid of history.[4]

The treatment may be summed up in a few words. The entire breast, along with any skin that may be invaded, must be extirpated, especial care being paid to the complete removal of every particle of paramammary fat and the fascia of the pectoral muscle, in which tissues experience shows that recurrence takes place. In the event of repullulation the growths should be freely excised as fast as they appear, as such a practice not only prolongs life, but may bring about a final cure.

ON THE REMEDIAL VALUE OF BLOODLETTING.

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IT has often seemed to me a matter of regret that a remedy of such unquestionable power as bloodletting should, from former abuse, be reckoned by many as among the things of the past, and that it should have run the risk of being denied all virtue, because of some inherent

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[1] Op. cit., p. 56, fig. 57.

[2] Lancet, January 8, 1887, p. 72.

[3] Inaug. Disser., Rostock, 1884, p. 15.

[4] Lehrbuch der Frauenkrankheiten, p. 756.